IN THE CLAIMS

1. – 17. **(Cancelled)**

18. **(New)** A method for analyzing sample ions, said method comprising the steps of:

generating ions from an ionization source;

introducing said ions into a first ion trap;

trapping said ions in said first ion trap for a first predetermined time;

releasing said ions from said first ion trap such that said ions are transferred into an analytical multipole;

selecting said ions of desired mass to charge ratio using said analytical multipole;

trapping said selected ions within a second ion trap for a second predetermined time; and

releasing said selected ions from said second ion trap such that said selected ions are transferred into a mass analyzer for analysis;

wherein said analytical multipole may be switchably powered on for a third predetermined time.

19. **(New)** The method of claim 18, wherein said analytical multipole is energized just before the end of said first predetermined time.

20. **(New)** The method of claim 18, wherein said ionization source is selected from the group consisting of electrospray, matrix-assisted laser desorption ionization, atmospheric pressure ionization, plasma desorption, electron ionization, and chemical ionization.

21. **(New)** The method of claim 18, wherein said mass analyzer is selected from the group consisting of time-of-flight mass analyzer, quadrupole mass analyzer, fourier transform ion cyclotron resonance mass analyzer, ion trap mass analyzer, magnetic mass analyzer, electrostatic mass analyzer, ion cyclotron resonance mass analyzer, quadrupole ion trap mass analyzer, and quadrupole time-of-flight mass analyzer.

22. **(New)** The method of claim 18, wherein a second group of ions is released from said first ion trap into said analytical multipole only after said selected ions have been transferred into said mass analyzer from said second ion trap.

23. **(New)** The method of claim 18, wherein at least one ion transfer device is positioned between said ionization source and said first ion trap.

24. **(New)** The method of claim 18, wherein said trapping and said selecting occur within a single pressure region.

25. **(New)** The method of claim 18, wherein said trapping and said selecting occur within separate pressure regions.

26. **(New)** The method of claim 18, wherein said ionization source is positioned coaxial with said first ion trap.

27. **(New)** The method of claim 18, wherein said ionization source is positioned orthogonal to said first ion trap.

28. **(New)** The method of claim 18, wherein said first ion trap is positioned in a first pressure region, said analytical multipole is positioned in a second pressure region, and said second ion trap is positioned in a third pressure region.

29. **(New)** The method of claim 28, wherein said first pressure region is at a pressure in the range of $1x10^{-3}$ mbar to $1x10^{-2}$ mbar.

30. **(New)** The method of claim 28, wherein said second pressure region is at a pressure in the range of $1x10^{-5}$ mbar to $1x10^{-3}$ mbar.

31. **(New)** The method of claim 28, wherein said third pressure region is at a pressure equal to or lower than the pressure of said second pressure region, said pressure being in the range of $1x10^{-5}$ mbar to $1x10^{-3}$ mbar.

32. **(New)** A method for analyzing sample ions, said method comprising the steps of:

generating ions from a sample material;

introducing said ions into a first ion trap, said first ion trap trapping said ions for a first predetermined period of time;

energizing an analytical multipole at the end of said first predetermined period of time;

releasing said ions from said first ion trap into said analytical multipole selecting said ions of desired mass to charge ratio using said analytical mulitpole;

trapping said selected ions within a second ion trap for a second predetermined time;

deenergizing said analytical multipole at the end of a third predetermined time; and

releasing said selected ions from said second ion trap into a mass analyzer.

33. **(New)** The method of claim 32, wherein said analytical multipole is energized just before the end of said first predetermined time.

34. (New) The method of claim 32, wherein said scobd in trap is used to fragment said selected ions.

35. **(New)** The method of claim 34, wherein said fragmented ions are released from said second ion trap such that said fragmented ions are transferred into said mass analyzer.

36. **(New)** The method of claim 32, wherein a second group of ions is released from said first ion trap into said analytical multipole only after said selected ions have been transferred into said mass analyzer from said second ion trap.

37. **(New)** The method of claim 32, wherein at least one ion transfer device is positioned between said ion source and said first ion trap.

38. **(New)** The method of claim 32, wherein said trapping and said selecting occur within a single pressure region.

39. **(New)** The method of claim 32, wherein said trapping and said selecting occur in separate pressure regions.

40. **(New)** The method of claim 32, wherein said mass analyzer is selected from the group consisting of time-of-flight mass analyzer, quadrupole mass analyzer, fourier transform ion cyclotron resonance mass analyzer, ion trap mass analyzer, magnetic mass analyzer, electrostatic mass analyzer, ion cyclotron resonance mass analyzer, quadrupole ion trap mass analyzer, and quadrupole time-of-flight mass analyzer.

41. **(New)** The method of claim 32, wherein ions are generated from said sample material using an ionization source that is selected from the group consisting of electrospray ion source, matrix-assisted laser desorption ionization source, atmospheric pressure ionization source, plasma desorption ion source, electron ionization source, and chemical ionization source.

42. **(New)** The method of claim 41, wherein said ionization source is positioned coaxial to said first ion trap.

43. **(New)** The method of claim 41, wherein said ionization source is positioned orthogonal to said first ion trap.

44. **(New)** The method of claim 32, wherein said first ion trap is positioned in a first pressure region, said analytical multipole is positioned in a second pressure region, and said second ion trap is positioned within a third pressure region.

45. **(New)** The method of claim 44, wherein said first pressure region is maintained at a pressure of $1x10^{-3}$ mbar to $1x10^{-2}$ mbar.

46. **(New)** The method of claim 44, wherein said second pressure region is at a pressure of $1x10^{-5}$ mbar to $1x10^{-3}$ mbar.

47. **(New)** The method of claim 44, wherein said third pressure region is at a pressure equal to or lower than the pressure of said second pressure region, said pressure being in the range of $1x10^{-5}$ mbar to $1x10^{-3}$ mbar.

48. **(New)** A method for analyzing sample ions, said method comprising the steps of:

(a) generating a first group of ions from a first sample material;

(b) introducing said first group of ions into a first ion trap, said first ion trap trapping said first group of ions for a first predetermined period of time;

(c) energizing a multipole just before the end of said first predetermined period of time, said multipole being energized for a second predetermined period of time;

(d) releasing said first group of ions from said first ion trap into said multipole, selecting said ions of desired mass to charge ratio using said multipole;

(e) trapping said selected ions from said first group of ions within a second ion trap for a third predetermined period of time;

(f) deenergizing said multipole at the end of said second predetermined time;

(g) releasing said selected ions from said first group of ions from said second ion trap into a mass analyzer;

(h) generating a second group of ions from a second sample material;

(i) introducing said second group of ions into said first ion trap during said second period of predetermined time, said first ion trap trapping said second group of ions for a fourth predetermined time; and

(j) repeating steps (c) through (g).

49. **(New)** The method of claim 48, wherein said selected ions are fragmented while in said second ion trap.

50. **(New)** The method of claim 48, wherein said fragmented ions are released from said second ion trap such that said fragmented ions are transferred into said mass analyzer.

51. **(New)** The method of claim 48, wherein said second group of ions is released from said first ion trap into said multipole only after said selected ions have been transferred into said mass analyzer from said second ion trap.

52. **(New)** The method of claim 48, wherein at least one ion transfer device is positioned between said ionization source and said first ion trap.

53. **(New)** The method of claim 48, wherein said trapping and said selecting occur in a single pressure region.

54. **(New)** The method of claim 48, wherein said trapping and said selecting occur in separate pressure regions.

55. **(New)** The method of claim 48, wherein said mass analyzer is selected from the group consisting of time-of-flight mass analyzer, quadrupole mass analyzer, fourier transform ion cyclotron mass analyzer, ion trap mass analyzer, magnetic mass analyzer, electrostatic mass analyzer, ion cyclotron resonance mass analyzer, quadrupole ion trap mass analyzer, and quadrupole time-of-flight mass analyzer.

56. **(New)** The method of claim 48, wherein ions are generated from said sample material using an ionization source is selected from the group consisting of an electrospray ionization source, matrix-assisted laser desorption ionization source, atmospheric pressure ionization source, plasma desorption ionization source, electron ionization source, and chemical ionization source.

57. **(New)** The method of claim 56, wherein said ionization source is positioned coaxial to said first ion trap.

58. **(New)** The method of claim 56, wherein said ionization source is positioned orthogonal to said first ion trap.

59. **(New)** The method of claim 48, wherein said first ion trap is positioned in a first pressure region, said analytical multipole is positioned in a second pressure region, and said second ion trap is positioned is a third pressure region.

60. **(New)** The method of claim 60, wherein said first pressure region is at a pressure of $1x10^{-3}$ mbar to $1x10^{-2}$ mbar.

61. **(New)** The method of claim 60, wherein said second pressure region is maintained at a pressure of $1x10^{-5}$ mbar to $1x10^{-3}$ mbar.

62. **(New)** The method of claim 60, wherein said third pressure region is at a pressure equal to or lower than the second pressure region, said pressure being in the range of $1x10^{-5}$ mbar to $1x10^{-3}$ mbar.